

Attorney Docket # 502901-198PUS

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Georg BOGNER et al.

Serial No.: 10/529,675

Filed: April 28, 2005

For: Illumination Device Having Luminous Spots

Formed By Light Emitting Diodes

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Examiner: Negron, Ismael
Group Art: 2885

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July 14, 2008
(Date of Deposit)

Alfred W. Froeblich
Name of applicant, assignee or Registered Representative

Signature

July 14, 2008
Date of Signature

APPEAL BRIEF

SIR:

This is an appeal, pursuant to 37 C.F.R. § 41.37 from the decision of the Examiner in the above-identified application, as set forth in the September 21, 2007 Final Office Action wherein the Examiner finally rejected Appellants' claims. The rejected claims are reproduced in the Appendix A attached hereto. A Notice of Appeal was filed on March 14, 2008.

The fee of \$510.00 for filing an Appeal Brief (Large Entity) pursuant to 37 C.F.R. § 41.20 is submitted herewith. Appellants request a one-month Extension of Time of the original shortened statutory response period to file this Appeal Brief. A Petition for the one-month extension of time is enclosed herewith along with the fee of \$120. Any additional fees or charges in connection with this application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

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REAL PARTY IN INTEREST

The assignee, Siemens Aktiengesellschaft Osram Opto Semiconductors GmbH, of applicants, Georg BOGNER, Patrick KROMOTIS, Ralf MAYER and Heinrich NOLL, is the real party of interest in the above-identified U.S. Patent Application.

RELATED APPEALS AND INTERFERENCES

There are no other appeals and/or interferences related to the above-identified application at the present time.

STATUS OF CLAIMS

Claims 1-21 have been cancelled. Claims 38-40 have been allowed. Claims 22-37 and 41-45 have been finally rejected. Claims 22-37 and 41-45 are the claims on appeal.

STATUS OF AMENDMENTS

An Amendment was filed on January 22, 2008 subsequent to the September 21, 2007 Final Office Action. In response, on February 19, 2008, the Examiner entered the Amendment and indicated that only claims 38-40 were allowed.

SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' invention of independent claim 22 is directed to an illumination device 1 for backlighting an image reproduction device containing light valves 6 (see amended pg. 1, lines 6-8 of the specification; FIG. 2). The illumination device 1 comprises a thermally conductive carrier 7 having a flat mounting surface (see amended pg. 2, lines 4-5 of the specification; FIG. 4) and a plurality of luminous spots 6 arranged in a grid format on the flat mounting surface of the carrier 7 (see amended pg. 1, lines 8-10 of the specification; FIGS. 2 and 3).

Each of the luminous spots 6 includes a plurality of light emitting diodes 9 and a submount 10 (see amended pg. 3, lines 20-21 of the specification; FIGS. 3 and 4). In addition, each of the plurality of light emitting diodes 9 of a respective one of the luminous spots 6 is electrically insulated from the others of the light emitting diodes of the respective one of the luminous spots (see amended pg. 1a, line 3 to amended pg. 2, line 1 of the specification; FIG. 3).

The submounts 10 exhibit good thermal conductivity and are connected to the flat mounting surface of the carrier 7 such that the connections between the submounts 10 and the carrier 7 exhibit good thermal conductivity (see amended pg. 2, lines 2-5 of the specification; FIG. 4).

Appellants' invention of independent claim 45 is directed to an illumination device 1 for backlighting an image reproduction device (see amended pg. 1, lines 6-8 of the specification; FIG. 2). The illumination device 1 comprises a thermally conductive carrier having a flat mounting surface (see amended pg. 2, lines 4-5 of the specification; FIG. 4).

A planar frame 5 is arranged on the flat mounting surface and defines a plurality of holes which are arranged in a grid format (see amended pg. 1, lines 8-10 of the specification; FIGS. 2 and 3). In addition, a plurality of luminous spots 6 are arranged on the flat mounting surface (see amended pg. 1, lines 8-10 of the specification; FIGS. 2 and 3).

Each of the luminous spots 6 is arranged in a respective one of the holes and includes a group of light emitting diodes arranged on a submount (see amended pg. 7, lines 11-14 of the specification; FIG. 2). As a result, the submount 10 is arranged between the group of light emitting diodes 9 and the carrier 7 (see amended pg. 1a, line 3 to amended pg. 2, line 2 of the specification; FIG. 4), where the submount 10 is thermally conductive such that connections between each of the submounts 10 and the carrier 7 are thermally conductive connections (see amended pg. 2, lines 2-5 of the specification; FIG. 4).

The device also includes lines 14 which are configured to supply power to the light emitting diodes arranged between the frame and the carrier in areas of the carrier that are unoccupied by the submounts (see amended pg. 2, lines 16-19; FIG. 4).

GROUND OF REJECTION TO BE REVIEWED IN APPEAL

1. Whether claims 22-37 and 41-45 are patentable under 35 U.S.C. §102(e) and 35 U.S.C. §103(a) over U.S. Patent Application Publication No. 2002/0006040 (“*Kamada*”)?

ARGUMENT

Independent claim 22 recites “a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said carrier, each of said luminous spots having a plurality of light emitting diodes and a submount”. Independent claim 45 recites “a plurality of luminous spots arranged on said flat mounting surface, each of said luminous spots being arranged in a respective one of said holes and including a group of light emitting diodes arranged on a submount”.

As described in more detail below, *Kamada* fails to disclose, teach or suggest these limitations because *Kamada* fails to teach or suggest “luminous spots having a plurality of light emitting diodes and a submount” or “luminous spots being arranged in a respective one of said holes and including a group of light emitting diodes arranged on a submount” as expressly recited in independent claims 22 and 45, respectively.

The Examiner (pg. 3 of the Final Office Action) asserts that:

KAMADA et al. discloses an illumination device...

- each of the luminous spots having a plurality of light emitting diodes (as recited in claims 22 and 45), Figure 6, reference numbers 1a-1d;

- each of the luminous spots having a submount, Figure 6, reference number 11...
- the submounts exhibiting good thermal conductivity (as recited in claims 22 and 45), as evidenced in paragraph 0123, lines 1-6....

Accordingly, the Examiner takes the position that the reference numeral 11 in FIG. 6 of *Kamada* is the claimed submount. Appellants disagree because, as will be described in more detail below, *Kamada* discloses that reference character 11 is a dent in a substrate or carrier 10.

Kamada discloses an LED luminaire formed by a plurality of LED chips disposed on a MID (molded interconnect device) substrate (see Abstract of *Kamada*). FIG. 6 of *Kamada* clearly shows the location of a mere dent 11.

A more detailed view of this dent or depressed area is shown in FIGS. 1 and 31 of *Kamada*. Indeed, FIG. 1 shows that the dent is a “hollowed out” open area of the substrate. In particular, FIGS. 1 and 2 of *Kamada* show a three dimensional circuit substrate 10 in the form of a MID (molded interconnect device) is formed to have an array of dents 11 with a plurality of LED chips 1 mounted within the hollowed out area of the dents, i.e., on a bottom or side of the dents (see paragraph 0046 of *Kamada*). *Kamada* further discloses the method of manufacturing the substrate 10 in paragraphs [0047] thru [0050], which involves injection molding a rectangular base from insulative material and then providing the dents 11 (see paragraph [0047]). A metal film is applied and selectively removed to form circuit parts 12 (with the film) and non-circuit parts (without the film) (see paragraphs [0048] thru [0050]). The LED chips 1 are mounted directly within the dents 11 and are connected to the circuit parts 12 (see paragraph [0051]). Thus, *Kamada* merely teaches that reference numeral 11 indicates the location of a hollowed out area of the dent in the substrate 10.

Accordingly, *Kamada* fails to disclose “each luminous spot having a plurality of light emitting diodes and a submount” as expressly recited in independent claim 22. Likewise,

Kamada fails to teach or suggest each of said luminous spots being arranged in a respective one of said holes and including a group of light emitting diodes arranged on a submount such that said submount is arranged between said group of light emitting diodes and said carrier, as expressly recited in independent claim 45.

Moreover, paragraph [0123] of *Kamada* describes an embodiment in which only one LED 1 is arranged on each heat emitter 16A (see FIG. 26). Independent claims 22 and 45 each require luminous spots that have a plurality of light emitting diodes and a submount. Therefore, without the luminous spots that have a plurality of light emitting diodes, there can be no submounts in *Kamada* that have a good thermal conductivity. Clearly, *Kamada* thus fails to teach or suggest a submount that would exhibit good thermal conductivity.

The February 19, 2008 Advisory Action takes the position that:

It is proper to take into account not only specific teachings of the reference but also inferences which one skilled in the art would reasonably be expected to draw therefrom. *In re Preda*, 159 USPQ 342 (CCPA 1968).

...

It must be recognized the dents 11 as broadly being a submount, as the plurality of LED 1a-1d are mounted within such dents 11 to form a cell S. The applicant is also directed to Figure 31.

Appellants do not agree with these assertions.

While it is true that it is proper to take into account not only specific teachings of the references but also inferences which one skilled in the art would reasonably be expected to draw therefrom, FIG. 31 of *Kamada* shows that reference numeral 11 points to a dent. As clearly shown in FIG. 31, the dent is actually the “open space” within the substrate 10, i.e., the above-identified “hollowed out” area of the substrate. The LED chips in FIG. 31 are not mounted on anything that would correspond to the claimed submount of independent claims 22 and 45. Indeed, *Kamada* (paragraph [0136], lines 10-13) specifically states that “the LED chips 10 are mounted on the

exposed conductive layer 19a of the metal element 19 at the bottom of the dents 11 in the substrate 10 and are sealed with the transparent resin". The skilled person would therefore not arrive at the conclusion that such a dent is a submount.

In view of the foregoing, the rejection of independent claims 22 and 45 should be withdrawn.

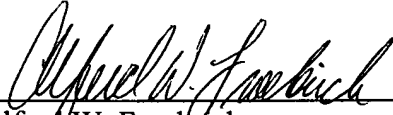
Dependent claims 23-37 and 39-44 are allowable for at least the same reasons that independent claims 22 and 45 are allowable, as well as for the additional limitations recited therein.

For the foregoing reasons, it is respectfully submitted that the teachings of *Kamada* fail to establish a *prima facie* case of anticipation or obviousness with regard to the subject matter recited in the claims. The Final Rejection of the claims should be reversed.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that appellants' claims are not anticipated or rendered obvious by *Kamada* and are, therefore, patentable over the art of record, and the Examiner's rejections should be reversed.

Respectfully submitted,
COHEN PONTANI LIEBERMAN & PAVANE LLP

By 
Alfred W. Froebrich
Reg. No. 38,887
551 Fifth Avenue, Suite 1210
New York, New York 10176
(212) 687-2770

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CLAIMS APPENDIX

1.-21. (Canceled)

22. (Previously Presented) An illumination device for backlighting an image reproduction device containing light valves, the illumination device comprising a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said carrier, each of said luminous spots having a plurality of light emitting diodes and a submount, each of said plurality of light emitting diodes of a respective one of said luminous spots being electrically insulated from the others of the light emitting diodes of the respective one of said luminous spots, said submounts exhibiting good thermal conductivity and connected to the flat mounting surface of said carrier such that the connections between said submounts and said carrier exhibit good thermal conductivity.

23. (Previously Presented) The illumination device of claim 22, wherein the area of said submounts is less than the entire area covered by the grid on said carrier, said illumination device further comprising lines for supplying power to the light emitting diodes arranged on that area of the carrier not occupied by submounts.

24. (Previously Presented) The illumination device of claim 23, wherein said lines for supplying power are routed in a flexible film that is continued as a flat lead outside said carrier.

25. (Previously Presented) The illumination device of claim 22, wherein said submounts are made of silicon.

26. (Previously Presented) The illumination device of claim 22, wherein said carrier is made of aluminum.

27. (Previously Presented) The illumination device of claim 22, wherein said carrier is made of copper.

28. (Previously Presented) The illumination device of claim 22, further comprising a heat sink connected to said carrier.

29. (Previously Presented) The illumination device of claim 23, wherein said insulating carrier comprises spaces between said submounts filled with plastic.

30. (Previously Presented) The illumination device of claim 22, wherein said plurality of light emitting diodes of a respective luminous spot emit varicolored light.

31. (Previously Presented) The illumination device of claim 22, wherein each of said plurality of luminous spots has four light emitting diodes.

32. (Previously Presented) The illumination device of claim 31, wherein said each of said plurality of luminous spots has two green-luminous light emitting diodes, one blue-luminous light emitting diode and one red-luminous light emitting diode.

33. (Previously Presented) The illumination device of claim 22, further comprising a plurality of reflectors, wherein a reflector surrounds each respective one of said luminous spots.

34. (Previously Presented) The illumination device of claim 33, wherein each reflector forms a depression that is filled with a transparent plastic.

35. (Previously Presented) The illumination device of claim 22, wherein a respective one of said plurality of light emitting diodes of one luminous spot is connected in series with a respective light emitting diode of another one of said plurality of luminous spots and forms an electric circuit.

36. (Previously Presented) The illumination device of claim 35, wherein the ones of said luminous spots having said light emitting diodes associated with said electric circuit are interleaved with luminous spots associated with at least one other electric circuit.

37. (Previously Presented) The illumination device of claims 35, wherein each luminous spot includes a plurality of identically colored light emitting diodes, each of the identically colored light emitting diodes being connected to different electric circuits.

38. (Allowed) An illumination device for backlighting an image reproduction device containing light valves, the illumination device comprising:

a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said

carrier, each of said luminous spots having a plurality of identically colored light emitting diodes and a submount, each of said plurality of identically colored light emitting diodes of a respective one of said luminous spots being electrically insulated from the others of the identically colored light emitting diodes of the respective one of said luminous spots, each of the identically colored light emitting diodes being connected to different electric circuits, said submounts exhibiting good thermal conductivity and connected to the flat mounting surface of said carrier such that the connections between said submounts and said carrier exhibit good thermal conductivity; and

control devices arranged and dimensioned for providing currents fed to each of the electric circuits, wherein said control devices, in the event of interruption of one of the electric circuits for said identically colored light emitting diodes which causes a color shift in the color produced by said luminous spot, control the currents in the electric circuits for the at least one other electric circuit for the identically colored light emitting diodes or for differently colored light emitting diodes of the same luminous spots to compensate for the color shift produced by the interruption;

wherein a respective one of said plurality of light emitting diodes of one luminous spot is connected in series with a respective light emitting diode of another one of said plurality of luminous spots and forms an electric circuit.

39. (Allowed) The illumination device of claim 38, wherein the control of the current comprises an increase in the current in the at least one other electric circuit for identically colored light emitting diodes.

40. (Allowed) The illumination device of claim 38, wherein the control of the current comprises a decrease in the current in the at least one other electric circuit for differently colored light emitting diodes.

41. (Previously Presented) The illumination device of claim 35, wherein said plurality of luminous spots form a grid of 4×8 luminous spots, each of said plurality of luminous spots having two green-luminous light emitting diodes and two red-luminous light emitting diodes, wherein four electric circuits are provided for the red-luminous light emitting diodes, two of said four electric circuits being assigned to said red-luminous light emitting diodes of identical luminous spots, said identical spots being distributed over the grid in checkered fashion.

42. (Previously Presented) The illumination device of claim 41, wherein each of said green-luminous light emitting diodes are connected to eight electric circuits, in each case one green-luminous light emitting diode of eight luminous spots being connected to one electric circuit and a further green-luminous light emitting diode of the same luminous spot being connected to another electric circuit.

43. (Previously Presented) The illumination device of claim 22, wherein said carrier is composed of ultrapure aluminum.

44. (Previously Presented) The illumination device of claims 22, wherein each luminous spot includes a plurality of identically colored light emitting diodes, each of the identically colored light emitting diodes being connected to different electric circuits.

45. (Previously Presented) An illumination device for backlighting an image reproduction device, comprising:

- a thermally conductive carrier having a flat mounting surface;

- a planar frame arranged on said flat mounting surface and defining a plurality of holes arranged in a grid format;

- a plurality of luminous spots arranged on said flat mounting surface, each of said luminous spots being arranged in a respective one of said holes and including a group of light emitting diodes arranged on a submount such that said submount is arranged between said group of light emitting diodes and said carrier, said submount being thermally conductive such that connection between each of said submounts and said carrier are thermally conductive connections; and

- lines configured to supply power to said light emitting diodes arranged between said frame and said carrier in areas of said carrier unoccupied by said submounts.

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE